INTRODUCTION TO ALGEBRA

Moving Numbers Around and Solving for X

Back in my day, Math 11 was just called "Algebra."

Algebra is really just moving numbers around to solve **ONE** part of the question.

16 = X + 15 <<< Algebra is "Solving For X"

1 = X + 9 <<< Still "Solving for X"

Basically: "What does X have to be to make this question work?"

You could guess and check – but that would be slow, especially if you are not good at Math.

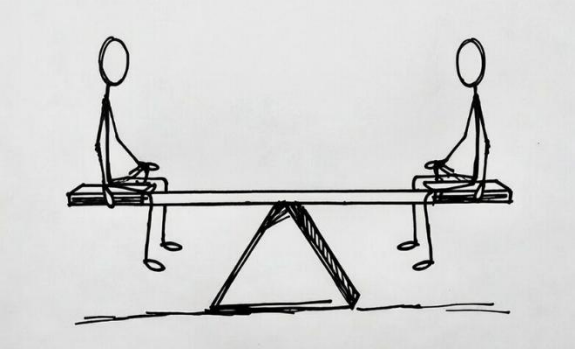
I'm not good at guessing.

For guys like me, there is an easier, fool-proof way to KNOW what X has to be – it's called "Algebra."

Mr. Wellwood's Algebra Secret #1:

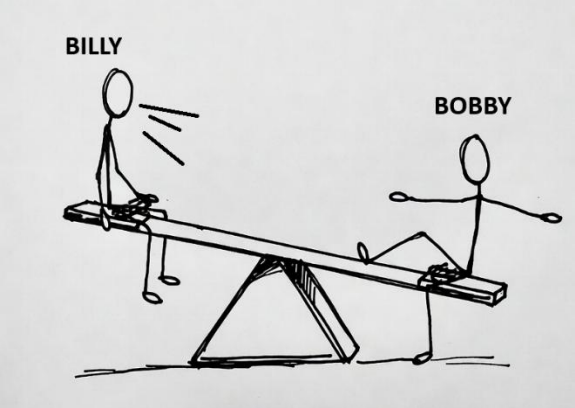
A math equation needs to be balanced. Whatever is on one side of the equation MUST balance what is on the other side.

Like a teeter-totter.



If Billy woofs his cookies, he's now LIGHTER than Bobby. The teeter-totter is now *unbalanced.*

Bobby's side of the teeter-totter will lower, and he'd probably get some puke on him.



Or…. Or Bobby could woof his cookies too, and they'd be equal again!

Mr. Wellwood's Algebra Secret #2:

Whatever you do to ONE SIDE of the equation, YOU MUST DO to the other side of the equation.

It's like punching Siamese Twins – you are really punching both of them.

Example 1 (easy):

16 = X + 15 <<<< I need to get X all by himself
The 15 is easy to get rid of, it's just being added.
Let's subtract that 15 ***FROM BOTH SIDES***

16 = X + 15 <<<< Keep the "=" lined up vertically!
-15 -15
1 = X <<<< Draw a BOX around your answer to make it easy to find

Check: if we put "1" into the X, do we have equal numbers on both sides?

16 = (1) + 15

16 = 16

Yes!

Example 2 (still easy):

18 = n - 9 <<<< I need to get **n** all by himself
The 9 is easy to get rid of, it's just being subtracted.
Let's add that 9 ***TO BOTH SIDES***

18 = n - 9 <<<< Keep the "=" lined up vertically!
+9 +9
27 = n <<<< Draw a BOX around your answer to make it easy to find

Check: if we put "27" into the n, do we have equal numbers on both sides?

18 = (27) - 9

18 = 18

Yes!

Example 3 (harder, but not really any harder at all):

$\frac{n}{9} = 20$ <<<< I need to get **n** all by himself

The 9 is easy to get rid of, it's just being divided.
Let's multiply that 9 ***TO BOTH SIDES***

$\frac{9 \times n}{9} = 20 \times 9$ <<<< Keep the "=" lined up vertically!

$\frac{\cancel{9} \times n}{\cancel{9}} = 180$ "CANCEL" the 9's on the left, and MULTIPLY on the right

n = 180 <<<< Draw a BOX around your answer to make it easy to find

Check: Yes - if we put "180" into the n…. 180 ÷ 9 = 20 …. 20 = 20

We have equal numbers on both sides!

Example 4 (harder still… or IS it??):

58 = 14n + 2 <<<< I need to get **n** all by himself
The 2 is easy to get rid of, it's just being added.
Let's subtract that 2 ***FROM BOTH SIDES***

58 = 14n + 2 <<<< Keep the "**=**" lined up vertically!
-2 -2

56 = 14n Let's divide the 14 ***FROM BOTH SIDES***

$\frac{56}{14} = \frac{14n}{14}$ CANCEL the two 14's…..

4 = n …. do math, and draw a box around your answer

Check: if we put "4" into the **n**, do we have equal numbers on both sides?

58 = 14 x (4) + 2

58 = 56 + 2

58 = 58

Yes!